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ABSTRACT

Time spent in contact with academic course materials as a function of two testing schedules was measured using college undergraduates in an introductory Educational Psychology course. A multi-manipulation single organism design was employed with all subjects enabling both individual and group analysis. A study room equipped with an adjacent observation room enabled visual and audio monitoring of student study behavior. Academic materials were available to students in the study room exclusively and records of duration and distribution of student study time were made by an observer having a one-way mirror. Daily testing produced consistent rates of study behavior with low absenteeism from the study room, while intermittent testing produced sporatic bursts of study behavior and frequent instances of absenteeism. Scalloping of study behavior rates occurred during the intermittent testing condition. Results suggest that daily testing supports more consistent study patterns than do intermittent testing programs. (Author)

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An Analysis of Student Studying Behavior As a Function of Two Schedules of Testing*

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Time spent in contact with academic course materials as a function of two testing schedules was measured using college undergraduates in an introductory Educational Psychology course. A multi-manipulation single organism design was employed with all subjects enabling both individual and group analyses. A study room equipped with an adjacent observation room enabled visual and audio monitoring of student study behavior. Academic materials were available to students in the study room exclusively and records of duration and distribution of student study time were made by an observer behind a one-way mirror. Daily testing produced consistant rates of study behavior with low absenteeism from the study room, while intermittent testing produced sporatic bursts of study behavior and frequent instances of absenteeism. Scalloping of study behavior rates occurred during the intermittent testing condition. Results suggest that daily testing supports more consistent study patterns than do intermittent testing programs.

Frequently, educational programs involve the employment of at least one, or a combination of three major categories of testing schedules. Typically, large inter-test intervals such as mid-terms and finals are used. A second schedule of testing involves inter-test intervals of much shorter duration such as daily quizzing. The third category ("pop quiz") differs from the first two in that it involves non-predictability of examination. Most of the research to date pertaining to testing schedules has explored the relationship between the frequency of testing and academic achievement. Previous research, Fitch, M. L., Drucker, A. J., and Norton, J. A., (1951); Proger, B. B., Mann, L., Taylor, R. G. Jr., Morrell, J. E. (1969), has suggested that frequent testing facilitates academic achievement.

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The present study deals with the relationship between testing schedules and the amount and placement of study behavior occurring in the inter-test interval. An analysis was made comparing study behavior produced by daily testing, and two testing schedules involving one-week intervals and three-week test intervals.

METHOD

EXPERIMENT I

Subjects: The subjects were six females, 18 to 51 years old, and two males, 21 and 23 years old, who were undergraduate or graduate students at Southern Illinois University. All subjects were members of a large lecture course in Educational Psychology, who elected to participate in a special reading section for course credit. Participation in the special reading section satisfied all course requirements for the regular lecture section. The criteria for selection of subjects were: (1) that they had no previous experience in behavioral psychology,* (2) that they had no less than an overall C average, and (3) that they had no academic or work committment during the hours the study room was available for their use.

Apparatus: The study materials were composed of the entire text of Ferster and Perrott Behavior Principles (1968), and selected chapters from Skinner The Technology of Teaching (1967). Identifying titles and names were removed. Each subject was assigned a specific numbered set of materials for which he was responsible for the duration of the study.

An attempt was made to equate daily reading assignments insofar as the organization of textual material allowed. Daily reading assignments varied between 12 and 22 pages. The Ferster and Perrott text is partially programmed with each major subject matter section followed by a set of behavioral objectives ("probes") related to that section. The objectives defined for the students some of the more important skills they were to acquire from the readings. In the case of the Skinner text, probes or behavioral objectives were prepared and incorporated within the textual materials. Course materials were presented in the following order: Ferster and Perrott Behavior Principles, Skinner Technology of Teaching, and during the last week of EXPERIMENT II selected readings in the construction of objectives, and the use of measurement techniques. The length of each daily reading assignment was determined prior to the beginning of the experiment.

* Prerequisite for the Educational Psychology class was a freshman course in general psychology.

Study Area: A well-lighted, air-conditioned 48' x 36' seminar room served as the study area for the subjects. The subjects sat in chairs or around a large table at one end of which the numbered study materials had been placed. Notices forbidding admittance to everyone other than the subjects during the designated hours were posted at all entrances to the room.

Response definition: Time spent "studying" was defined as that period from when the subject seated himself at the table with the materials in front of him until he unseated himself. The observer recorded the total minutes each subject spent reading the study materials during each three-hour period. Behaviors such as glancing about the room, counting of pages, lighting a cigarette, etc. were scored as being part of the total complex of study behavior and were included as "time spent studying." Observers scored times to the nearest half-minute.

Observers and observation area: The observers were four males, two graduate students and two faculty members of Southern Illinois University. Observations were made by a single observer who served for the entire study period on a given day. Adjacent to the study area were two 14' by 17' rooms, each containing a 36" x 46" one-way glass window which afforded an unobstructed view of the study area. The observer sat at a table behind one of these windows, visually monitored the study behavior of the subjects and recorded the times they began and ceased studying. A microphone in the wall of the study area permitted continuous sound monitoring of the subjects. Inter-rater reliabilities were collected aperiodically and ranged from .96 to 1.00.

Procedure

Instructions to subjects: All subjects recieved a course outline which detailed procedures that were followed in the course: use of study area, the relationship of behavioral objectives to the textual material, and the relationship of accumulated quiz points to the final grade. The study area was made available to the subjects form 3PM to 6PM on Monday through Thursday. They were permitted to come or go from this area as frequently as they chose during this period, or not attend at all if they wished, in order that they might develop their own study habits. Students were allowed to write on the study materials, or take notes, but neither could then be removed. In addition, the following requests were made and enforced: (1) verbalizations were to be kept at a minimum, (2) subjects were to avoid bringing visitors into the study room, (3) they were to study only the course material provided in the room, and (4) under no circumstances were materials or notes pertaining to the materials to be taken from the study room.

Testing: Daily tests were worth 5 points each and weekly tests were worth 20 points. Tests were either multiple-choice, true-false, or fill-in-the-blank and each item was normally worth one point. Each test period was followed by a voluntary discussion period wherein test items and study materials would be reviewed and discussed. Subjects were tested over the study materials on Tuesday through Friday if the schedule of testing was daily, or on Friday only, if the schedule was weekly. The study was nine weeks in duration. During the first three weeks materials for any one day's reading were presented for one study session only. On the following day a five-point quiz was given over those materials. During weeks four and five, the total reading materials for the reading assignment each week were available during each study session. A 20 point test was given on Friday of each of these weeks. The total number of test questions per week under either of the testing conditions remained constant at 20. During week six daily quizzes were again given, however, all study materials for the week's quizzes were made available on Monday. The length of the section relevant to the following day's quiz was indicated by an inserted note. During weeks number seven and eight weekly testing schedules were again employed. During the ninth week conditions were again returned to daily testing with all materials available beginning Monday.

EXPERIMENT II

Subjects and apparatus: Subjects were six females and six males, ages 19 to 26 years, taken on a volunteer basis from an undergraduate course in Educational Psychology. Criteria for the selection of subjects, reading materials, study and observation areas, instructions to the subjects, and response definition remained identical to those employed in EXPERIMENT I.

Procedure: Reading materials were introduced such that at any time during the course at least two subsequent weeks of reading material were available to the students. The accumulated reading materials remained available throughout the duration of the course. Two testing intervals were presented alternately, daily testing and testing after a three-week interval. During the first two weeks subjects were tested daily with 5-point quizzes using objective test items. Beginning with week three, a three-week testing schedule was employed. At the end of this interval, a sixty item quiz was given. All reading materials for the 3-week testing interval were available on day one of week three. During weeks 6 and 7 the daily testing schedule was again in effect. Following week number 7, the three week schedule was reinstituted.

RESULTS

EXPERIMENT I

Figure 1 shows individual study time in minutes per session.

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All subjects studied on every day the study room was open during the daily testing conditions. However, the change in testing conditions from daily to weekly produced a marked increase in the variability in minutes studied from session to session for each individual, and the occurrence of frequent instances of non-attendance.

The performance of subjects 6 and 7 most dramatically reveals the change in study patterns produced by a shift from daily to weekly testing schedules. In addition, these subjects displayed a scalloped response pattern, i.e. minutes studied per study session tended to increase with increasing proximity to the weekly test. However, subject #8 displayed no systematic change in study pattern throughout the experiment.

EXPERIMENT II

Figures 2 and 3 show individaul study time in minutes per session. Under daily testing conditions, the number of minutes studied per session for individual subjects, revealed consistent daily attendance in the study room. Subjects 9, 10, and 13

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represent exceptions to the 100% attendance in the study room observed during the daily testing conditions. Beginning with session 21, Subjects 10 and 13 admitted having taken employment which made it impossible to attend certain study sessions. Subject No. 9 gave as reason for his absence in session No. 21 that he "had car trouble." The change in testing conditions from daily to weekly produced a marked increase in the variability in minutes studied from session to session for every individaul. Without exception, when the testing schedule was changed from daily to a three week schedule, each subject displayed absence from the study area and nearly all subjects displayed scalloped response patterns in either one or both of the 3-week test intervals.

In session No. 21, a double reading assignment was accidently given which correlates with the unusually large number of minutes studied on that day for subjects 14, 15, 17, and 18.

Figure 4 represents group average minutes studied per session under each of the testing schedules. In contrast to

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the relatively stable performance during daily testing conditions, subjects displayed an increase in average minutes per study session with increasing temporal proximity to the 3-week test.

DISCUSSION

EXPERIMENTS I and II demonstrate a functional relationship between testing schedules and the amount and distribution of study behavior. Daily testing produced stable amounts of study behavior with virtually no absences from the study room. Results in EXPERIMENT I showed that during the weekly testing condition studying behavior became inconsistent with respect to the amount of time spent per session, and was the only condition under which absenteeism occurred. Several subjects were observed to study by increasing amounts as the time of testing drew near. In order to determine if the scallop effects observed in EXPERIMENT I would become more pronounced at larger inter-test intervals, EXPERIMENT II was conducted. The three week testing interval employed in EXPERIMENT II also produced a great deal of variability in time spent studying per day and frequent absenteeism. In addition, with most subjects, pronounced scallop effects were observed to occur in the study behavior emitted by subjects during the 3-week testing interval.

Judging from the prevalent use of course syllabi and large inter-test intervals, i.e. mid-terms and finals, such testing and course administration is assumed to motivate the student to study in a consistent fashion for the duration of the course. The potential argument that only poor students lack the motivation to study consistently at times far removed from course examinations is not supported by the present study. All subjects used in EXPERIMENTS I and II maintained academic averages of C or above. Large lecture courses at the university level often are operated with the assumption that students come to lecture sessions having prepared themselves to understand the verbal behavior of the lecturer. The results of the present study lend serious question to the validity of large interval testing schedules as being adequate instructional and motivational devices.

The present reaearch suggests two further research questions: (1) what are the effects of testing schedules in which testing is on a non-predictable basis, and (2) how will students behave, when given the opportunity to select the schedules under which they are to be testsd? Research in both of these areas of investigation is currently under way.

REFERENCES

Ferster, C. B., and Perrott, M. C. Behavior Principles, New York: Appleton-Century-Crofts, 1968.

Fitch, M., Drucker, A., and Norton, J. Frequent testing as a motivating factor in large lecture classes. The Journal of Educational Psychology, Vol. 42, 1, pgs. 1-20.

Proger, B., Mann, L., Taylor, R. G., and Morrell, J. E. The relationship between frequency of testing, arithmetic achievement and induced test anxiety in sixth grade students. See 1969 AERA meeting abstracts pgs. 190-191.

Skinner, B. F. The Technology of Teaching, New York: Appleton-Century-Crofts, 1967.

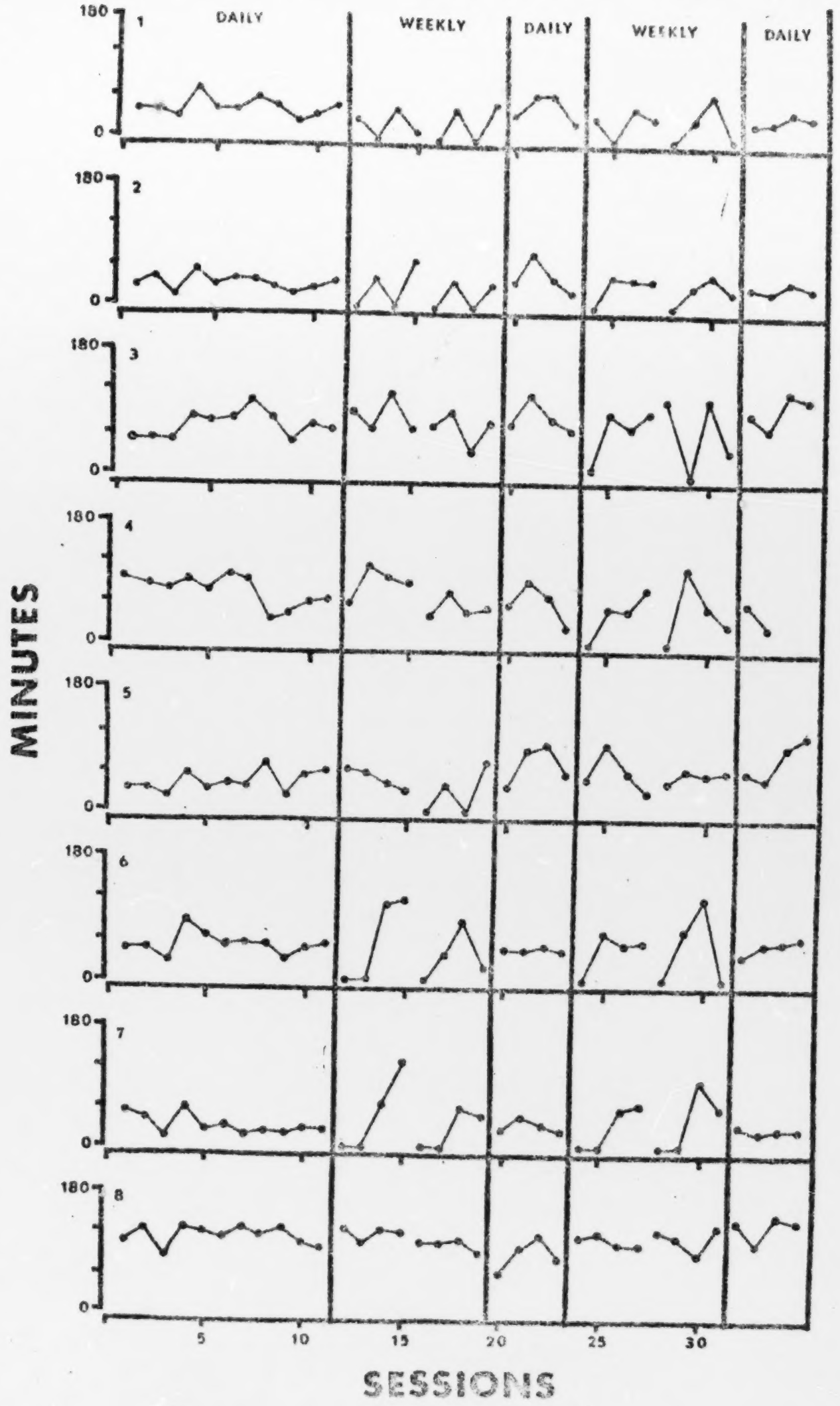

Figure 1. Minutes spent in contact with study materials per session for each subject in EXPERIMENT I.

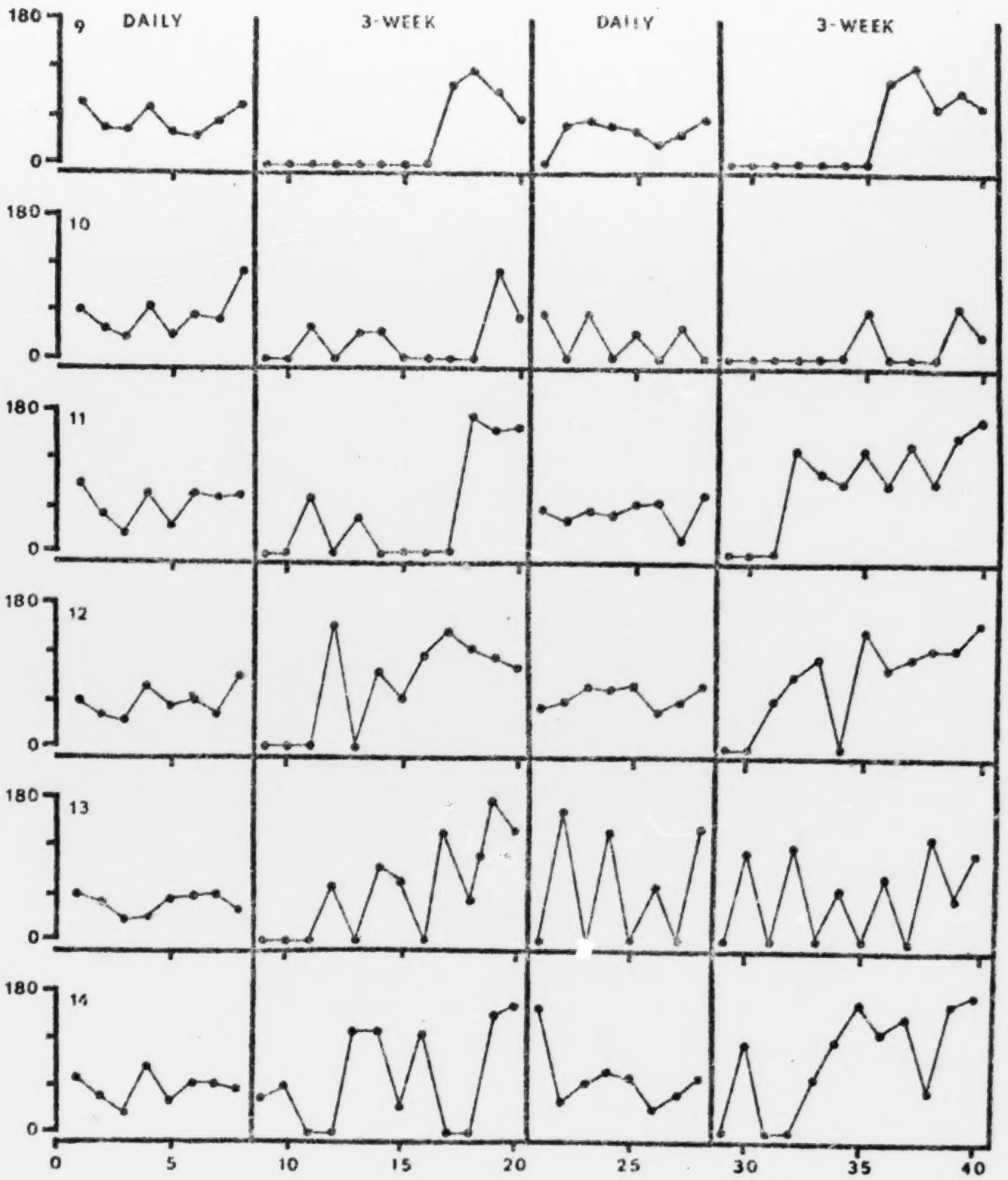

Figure 2. Minutes spent in contact with study materials per session for Subjects #9 through #14 of EXPERIMENT II.

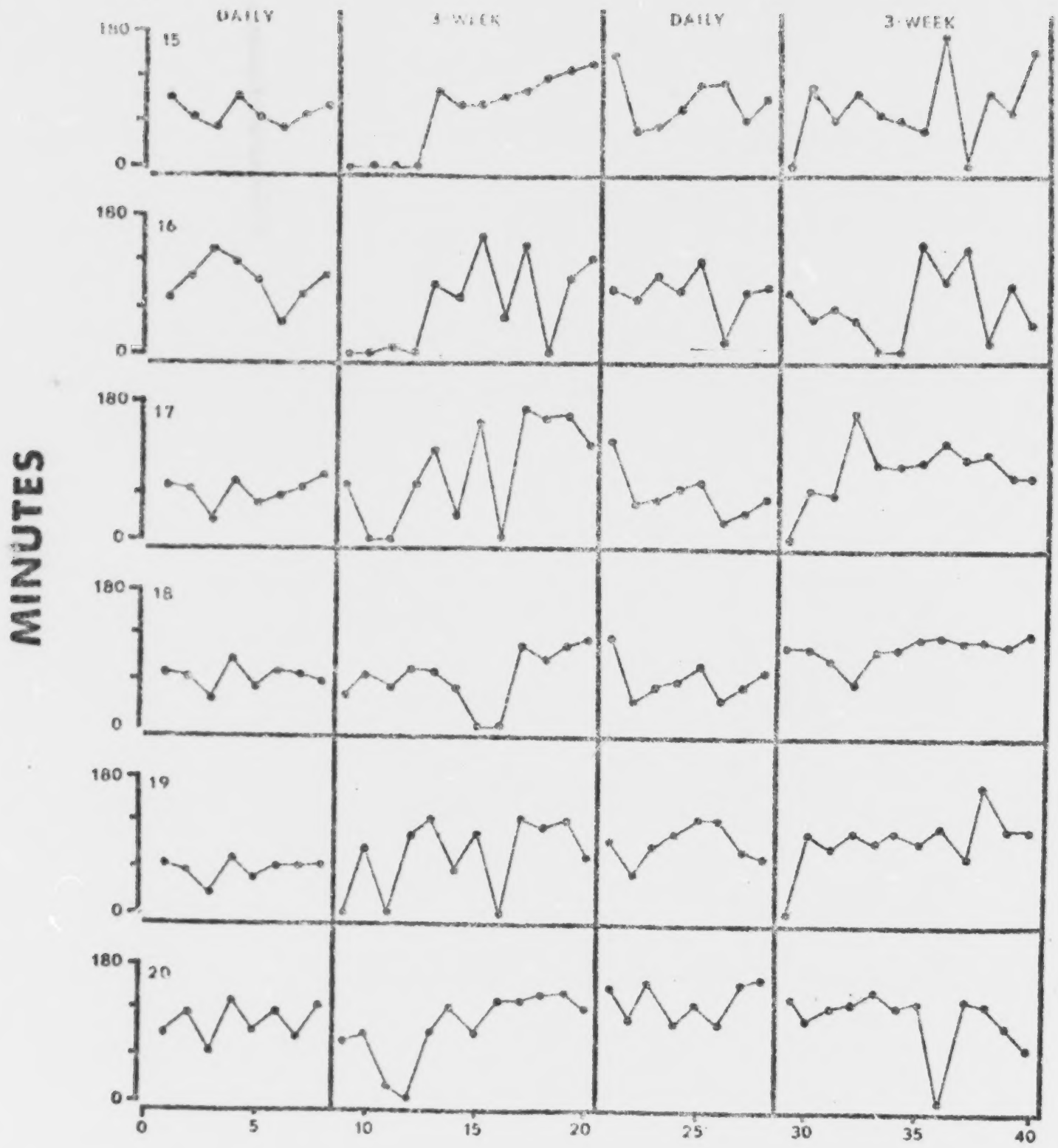

Figure 3. Minutes spent in contact with study materials per session for Subjects #15 through #20 of EXPERIMENT II.

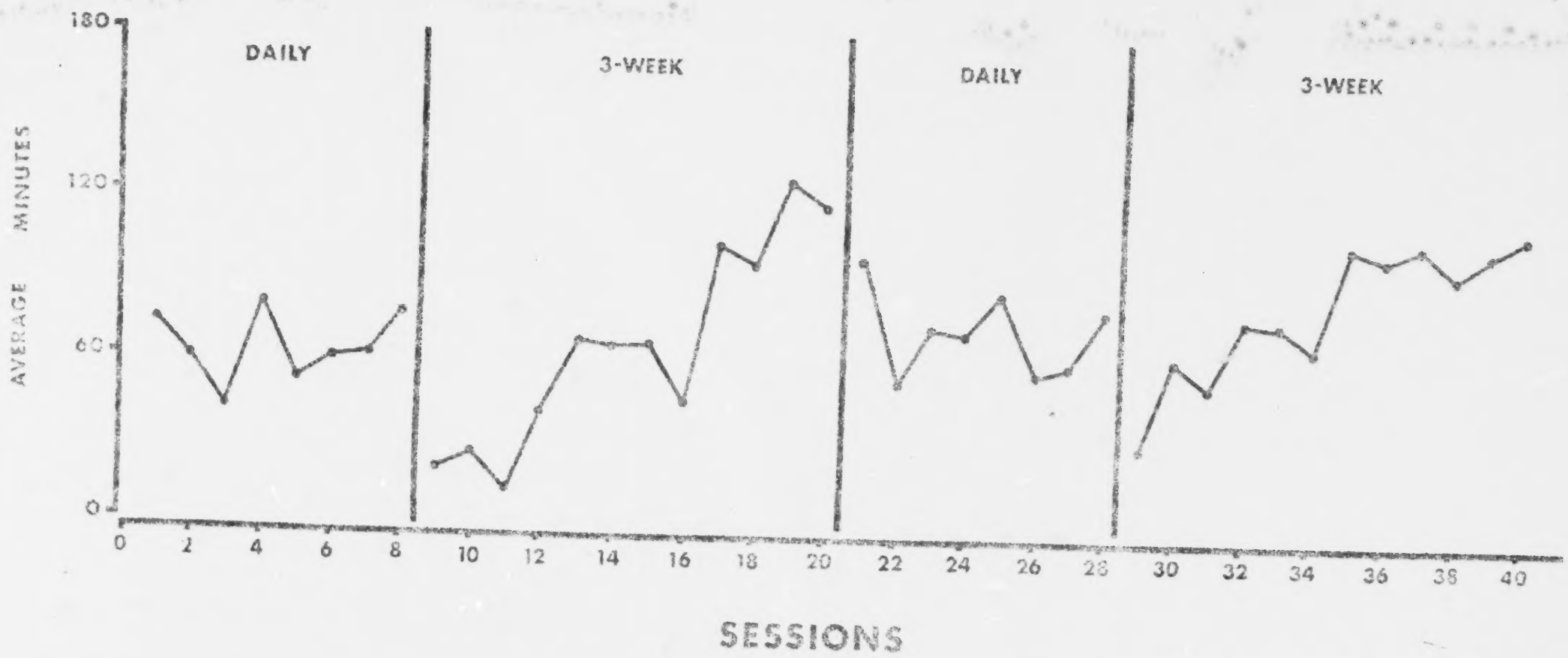

Figure 4. Average time in minutes of all subjects in EXPERIMENT II spent in contact with study materials per session.